

WHAT IS CLAIMED IS:

1           1.     A developing method comprising:  
2                   providing a wafer in a reaction space, wherein said wafer has an exposed  
3     photoresist thereon;  
4                   coating a developing solution on a surface of said wafer;  
5                   rotating said wafer;  
6                   rinsing a normal surface and a backside surface of said wafer; and  
7                   stopping rinsing said normal surface of said wafer while keeping rinsing  
8     said backside surface of said wafer for a specific time period.

1           2.     A developing method according to claim 1 wherein said reaction  
2     space is within a developing coating apparatus.

1           3.     A developing method according to claim 1 wherein rotating said  
2     wafer comprises increasing a rotating rate of said wafer.

1           4.     A developing method according to claim 3 further comprising  
2     stopping rotation of said wafer for a period to perform a developing step on said wafer  
3     before increasing the rotating rate of said wafer from a low speed to a high speed.

1           5.     A developing method according to claim 3 wherein rotating said  
2     wafer comprises increasing the rotating rate of said wafer from a low speed of about 30-90  
3     rpm to a high speed of about 1000-4000 rpm.

1           6.     A developing method according to claim 1 further comprising  
2     exhausting said reaction space while rotating said wafer.

1           7.     A developing method according to claim 1 wherein rinsing said  
2     backside surface of said wafer is performed by a nozzle disposed near said backside  
3     surface of said wafer.

1           8.     A developing method according to claim 7 wherein said nozzle is  
2     disposed to direct a solution to said backside surface of said wafer at an incident angle of  
3     substantially less than about 90 degrees relative to said backside surface of said wafer.

1                   9.     A developing method according to claim 1 wherein said specific  
2     time period of stopping rinsing said normal surface of said wafer and keeping rinsing said  
3     backside surface of said wafer is at least about five seconds.

1                   10.    A developing method according to claim 1 wherein rotating said  
2     wafer comprises rotating said wafer at a sufficiently low speed while coating said  
3     developing solution on said surface of said wafer to form a fluid wall to prevent said  
4     developing solution from flowing to at least a portion of said backside surface of said  
5     wafer.

1                   11.    A method for reducing contamination formed on a backside surface  
2     of a wafer, the method comprising:

3                   providing a wafer in a reaction space, wherein said wafer has an exposed  
4     photoresist thereon;  
5                   coating a developing solution on a surface of said wafer;  
6                   rotating said wafer and exhausting said reaction space while rotating said  
7     wafer;  
8                   rinsing a normal surface and a backside surface of said wafer; and  
9                   stopping rinsing said normal surface of said wafer and while keeping  
10     rinsing said backside surface of said wafer for a specific time period, thereby reducing the  
11     contamination forming on said backside surface of said wafer.

1                   12.    A method according to claim 11 wherein said reaction space is  
2     within a developing coating apparatus.

1                   13.    A method according to claim 11 wherein rotating said wafer  
2     comprises increasing a rotating rate of said wafer.

1                   14.    A method according to claim 11 wherein exhausting said reaction  
2     space comprises generating an outward-flowing field at said backside surface of said  
3     wafer.

1                   15.    A method according to claim 11 wherein rinsing said backside  
2     surface of said wafer is performed by a nozzle disposed near said backside surface of said  
3     wafer.

1                   16.    A method according to claim 15 wherein said nozzle is disposed to  
2 direct a solution to said backside surface of said wafer at an incident angle of substantially  
3 less than about 90 degrees relative to said backside surface of said wafer.

1                   17.    A method according to claim 11 wherein said specific time period  
2 of stopping rinsing said normal surface of said wafer and keeping rinsing said backside  
3 surface of said wafer is at least about five seconds.

1                   18.    A developing method, applied in a developing coating apparatus  
2 comprising a chuck, at least one nozzle and a groove, the method comprising:

3                   providing a wafer and supporting said wafer on said chuck of said  
4 developing coating apparatus with a backside surface of the wafer facing said groove,  
5 wherein said wafer has exposed photoresist thereon;

6                   coating a developing solution on a surface of said wafer;

7                   rotating said wafer and exhausting said developing coating apparatus to  
8 form a water wall between said wafer and an outer sidewall of said groove;

9                   rinsing a normal surface and rising said backside surface of said wafer by  
10 said at least one nozzle; and

11                  stopping rinsing said normal surface of said wafer and keeping rinsing said  
12 backside surface of said wafer for a specific period, thereby removing contamination  
13 remaining on said lower surface of said wafer.

1                   19.    A developing method according to claim 18 further comprising  
2 increasing a rotating rate of said wafer prior to rinsing said wafer.

1                   20.    A developing method according to claim 18 wherein said nozzle is  
2 disposed to direct a solution to said backside surface of said wafer at an incident angle of  
3 substantially less than about 90 degrees relative to said backside surface of said wafer.

1                   21.    A developing method according to claim 18 wherein said specific  
2 time period of stopping rinsing said normal surface of said wafer and keeping rinsing said  
3 backside surface of said wafer is at least about five seconds.